C L A I M S

1. A packet communication network characterized by comprising a plurality of routers which are connected in a network form through communication links, and a plurality of route control servers each of which is arranged in one of areas provided by dividing the packet communication network and controls the router in the area,

wherein said route control server comprises a destination information acquisition unit which acquires destination information of a packet from header information of the packet, the header information being sent from said router in the area, a route control unit which generates inter-server information containing the destination information acquired by said destination information acquisition unit and transfer management information made to correspond to the destination information in advance, an inter-server information transmission/reception unit which transmits/receives the inter-server information to/from another route control server, and a packet control unit which determines an output interface of the packet in said router on the basis of the destination information and transfer management information and determines the output interface of the packet on the basis of destination information and transfer management information contained in inter-server information from another route

27   control server, and

28   said router comprises a header information

29   acquisition unit which acquires the header information

30   from the arrival packet and notifies the route control

31   server of the acquired header information, and an output

32   interface control unit which outputs the arrival packet

33   from the output interface corresponding to the packet to

34   a communication link connected to the output interface

35   on the basis of the determination in said route control

36   server.

              2.   A packet communication network according

2   to claim 1, characterized by further comprising

3   a plurality of packet transfer apparatuses

4   each of which is provided in each area to store a

5   plurality of user terminals and connected to an optical

6   wavelength path of the photonic network, encapsulates,

7   in a lower layer frame, an upper layer packet received

8   from one of a user network which stores a transmission

9   source user terminal and an external network which

10   stores the transmission source user terminal and

11   transfers the lower layer frame, in transmitting the

12   lower layer frame to the external network, transfers the

13   lower layer frame after decapsulating the lower layer

14   frame to the upper layer packet, and executes mutual

15   conversion and transfer of an upper layer packet on a

16   side of a user terminal corresponding to an upper layer

17   packet address and a lower layer frame on a side of an

18   optical wavelength path corresponding to a lower layer

19   frame address on the basis of an address management

20   table which manages correspondence between the upper

21   layer packet address and the destination lower layer

22   frame address, and

23   an admission control server which is provided

24   in each area and sets, of optical wavelength paths of

25   the photonic network, an optical wavelength path to

26   connect packet transfer apparatuses of transmission

27   source and destination in accordance with an optical

28   wavelength path connection request received from the

29   transmission source user terminal through said packet

30   transfer apparatus,

31   wherein said router comprises a frame transfer

32   apparatus which is connected to the optical wavelength

33   path of the photonic network to receive the lower layer

34   frame from the transmission source packet transfer

35   apparatus and transfer the lower layer frame to a packet

36   transfer apparatus corresponding to the upper layer

37   packet address of the upper layer packet in the lower

38   layer frame, and

39   said admission control server comprises a

40   route setting function unit which, in setting the

41   optical wavelength path, registers correspondence

42   between the upper layer packet address of the user

43   terminal and the lower layer frame address corresponding

44   to the optical wavelength path in the address management

45 tables of the packet transfer apparatuses of the

46 transmission source and destination, sets, between the

47 packet transfer apparatuses of the transmission source

48 and destination, an optical wavelength path formed from

49 a cut-through optical wavelength path which has a

50 guaranteed band and passes through only at least one

51 wavelength switch when a band guarantee request is

52 present, and sets an optical wavelength path which

53 connects the packet transfer apparatuses of the

54 transmission source and destination through said frame

55 transfer apparatus when no band guarantee request is

56 present.

     3.   A packet communication network according

2 to claim 2, characterized in that

3   said packet transfer apparatus manages

4 correspondence between a destination upper layer packet

5 address and a destination lower layer frame address in

6 the address management table, converts the upper layer

7 packet from the user terminal side into the lower layer

8 frame, and transfers the lower layer frame to the

9 optical wavelength path of the destination lower layer

10 frame address corresponding to the destination upper

11 layer packet address.

     4.   A packet communication network according

2 to claim 2, characterized in that

3   said packet transfer apparatus manages

4 correspondence between transmission source and

5   destination upper layer packet addresses and a

6   destination lower layer frame address in the address

7   management table, converts the upper layer packet from

8   the user terminal side into the lower layer frame, and

9   transfers the lower layer frame to the optical

10 wavelength path of the destination lower layer frame

11 address corresponding to the transmission source and

12 destination upper layer packet addresses.

        5.   A route control server which is arranged

2   in one of areas provided by dividing a packet

3   communication network including a plurality of routers,

4   characterized by comprising:

5   a destination information acquisition unit

6   which acquires destination information of a packet from

7   header information of the packet, the header information

8   being sent from the router in the area;

9   a route control unit which generates

10 inter-server information containing the destination

11 information acquired by said destination information

12 acquisition unit and transfer management information

13 made to correspond to the destination information in

14 advance;

15   an inter-server information

16 transmission/reception unit which transmits/receives the

17 inter-server information to/from another route control

18 server; and

19   a packet control unit which determines an

20   output interface of the packet in the router on the

21   basis of the destination information and transfer

22   management information,

23   wherein said packet control unit determines

24   the output interface of the packet on the basis of

25   destination information and transfer management

26   information contained in inter-server information from

27   another route control server.

              6.   A route control server according to claim

2   5, characterized in that in transmitting the

3   inter-server information, said inter-server information

4   transmission/reception unit transmits the inter-server

5   information to only a route control server in an area

6   through which the packet having the destination

7   information passes.

              7.   A route control server according to claim

2   5, characterized in that said packet control unit

3   determines the output interface of the packet having the

4   destination information on the basis of the destination

5   information and transfer management information

6   contained in the received inter-server information which

7   said inter-server information transmission/reception

8   unit has received from another route control server.

              8.   A route control server according to claim

2   7, characterized in that said packet control unit

3   determines the output interface related to the

4   destination information only when a subsequent area

5   through which the packet having the destination

6   information of the inter-server information passes is

7   present.

9.   A route control server according to claim

2   5, characterized in that the transfer management

3   information contains information representing one of

4   priority and a size of a communication band in transfer

5   processing of the packet having the destination

6   information.

10.   A route control method characterized by

2   comprising:

3   the header information acquisition step of

4   causing a plurality of routers which are connected in a

5   network form through communication links to form a

6   packet communication network to acquire header

7   information from an arrival packet and send the header

8   information to, of a plurality of route control servers

9   each of which is arranged in one of areas provided by

10 dividing the packet communication network and controls

11 the router in the area, a route control server

12 corresponding to the area of the router;

13   the destination information acquisition step

14 of causing the route control server to acquire

15 destination information of the packet from the header

16 information of the packet, the header information being

17 sent from the router in the area;

18   the route control step of causing the route

19 control server to generate inter-server information

20 containing the destination information acquired in the

21 destination information acquisition step and transfer

22 management information made to correspond to the

23 destination information in advance;

24   the inter-server information

25 transmission/reception step of causing the route control

26 server to transmit/receive the inter-server information

27 to/from another route control server;

28   the packet control step of causing the route

29 control server to determine an output interface of the

30 packet in the router on the basis of the destination

31 information and transfer management information and

32 determine the output interface of the packet on the

33 basis of destination information and transfer management

34 information contained in inter-server information from

35 another route control server; and

36   the output interface control step of causing

37 the router to output the arrival packet from the output

38 interface corresponding to the packet to a communication

39 link connected to the output interface on the basis of

40 the determination in the route control server.

         11. A program which causes a computer of a

2 route control server which is arranged in one of areas

3 provided by dividing a packet communication network

4 including a plurality of routers and controls the router

5 in the area to execute:

6   the destination information acquisition step

7   of acquiring destination information of a packet from

8   header information of the packet, the header information

9   being sent from the router in the area;

10   the route control step of generating

11 inter-server information containing the destination

12 information acquired in the destination information

13 acquisition step and transfer management information

14 made to correspond to the destination information in

15 advance;

16   the inter-server information

17 transmission/reception step of transmitting/receiving

18 the inter-server information to/from another route

19 control server; and

20   the packet control step of determining an

21 output interface of the packet in the router on the

22 basis of the destination information and transfer

23 management information and determining the output

24 interface of the packet on the basis of destination

25 information and transfer management information

26 contained in inter-server information from another route

27 control server.

12.   A recording medium which records a

2   program to cause a computer of a route control server

3   which is arranged in one of areas provided by dividing a

4   packet communication network including a plurality of

5   routers and controls the router in the area to execute:

6   the destination information acquisition step

7 of acquiring destination information of a packet from

8 header information of the packet, the header information

9 being sent from the router in the area;

10   the route control step of generating

11 inter-server information containing the destination

12 information acquired in the destination information

13 acquisition step and transfer management information

14 made to correspond to the destination information in

15 advance;

16   the inter-server information

17 transmission/reception step of transmitting/receiving

18 the inter-server information to/from another route

19 control server; and

20   the packet control step of determining an

21 output interface of the packet in the router on the

22 basis of the destination information and transfer

23 management information and determining the output

24 interface of the packet on the basis of destination

25 information and transfer management information

26 contained in inter-server information from another route

27 control server.

    13. A packet communication network

2 characterized by comprising:

3   a plurality of packet transfer apparatuses

4 each of which stores a plurality of user terminals, is

5 connected to an optical wavelength path of a photonic

6   network including a transmission link having an optical

7   wavelength path multiplex transmission function and a

8   wavelength switch having an optical wavelength path

9   switching function, encapsulates, in a lower layer

10 frame, an upper layer packet received from one of a user

11 network which stores a transmission source user terminal

12 and an external network which stores the transmission

13 source user terminal and transfers the lower layer

14 frame, in transmitting the lower layer frame to the

15 external network, transfers the lower layer frame after

16 decapsulating the lower layer frame to the upper layer

17 packet, and executes mutual conversion and transfer of

18 an upper layer packet on a side of a user terminal

19 corresponding to an upper layer packet address and a

20 lower layer frame on a side of an optical wavelength

21 path corresponding to a lower layer frame address on the

22 basis of an address management table which manages

23 correspondence between the upper layer packet address

24 and the destination lower layer frame address;

25   an admission control server which sets, of

26 optical wavelength paths of the photonic network, an

27 optical wavelength path to connect packet transfer

28 apparatuses of transmission source and destination in

29 accordance with an optical wavelength path connection

30 request received from the transmission source user

31 terminal through said packet transfer apparatus; and

32   a frame transfer apparatus which is connected

33   to the optical wavelength path of the photonic network

34   to receive the lower layer frame from the transmission

35   source packet transfer apparatus and transfer the lower

36   layer frame to a packet transfer apparatus corresponding

37   to the upper layer packet address of the upper layer

38   packet in the lower layer frame,

39   wherein said admission control server

40   comprises a route setting function unit which, in

41   setting the optical wavelength path, registers

42   correspondence between the upper layer packet address of

43   the user terminal and the lower layer frame address

44   corresponding to the optical wavelength path in the

45   address management tables of the packet transfer

46   apparatuses of the transmission source and destination,

47   sets, between the packet transfer apparatuses of the

48   transmission source and destination, an optical

49   wavelength path formed from a cut-through optical

50   wavelength path which has a guaranteed band and passes

51   through only at least one wavelength switch when a band

52   guarantee request is present, and sets an optical

53   wavelength path which connects the packet transfer

54   apparatuses of the transmission source and destination

55   through said frame transfer apparatus when no band

56   guarantee request is present.

       14.   A packet communication network according

2   to claim 13, characterized in that

3   said packet transfer apparatus manages

4 correspondence between a destination upper layer packet

5 address and a destination lower layer frame address in

6 the address management table, converts the upper layer

7 packet from the user terminal side into the lower layer

8 frame, and transfers the lower layer frame to the

9 optical wavelength path of the destination lower layer

10 frame address corresponding to the destination upper

11 layer packet address.

15. A packet communication network according

2 to claim 13, characterized in that

3   said packet transfer apparatus manages

4 correspondence between transmission source and

5 destination upper layer packet addresses and a

6 destination lower layer frame address in the address

7 management table, converts the upper layer packet from

8 the user terminal side into the lower layer frame, and

9 transfers the lower layer frame to the optical

10 wavelength path of the destination lower layer frame

11 address corresponding to the transmission source and

12 destination upper layer packet addresses.

16. A packet transfer apparatus characterized

2 in that said apparatus is used in a packet communication

3 network formed from a network logically built on a

4 photonic network including a transmission link having an

5 optical wavelength path multiplex transmission function

6 and a wavelength switch having an optical wavelength

7 path switching function, the packet communication

8　　network comprising an admission control server which

9　　sets, of optical wavelength paths of the photonic

10　　network, one of an optical wavelength path formed from a

11　　cut-through optical wavelength path which has a

12　　guaranteed band and connects packet transfer apparatuses

13　　of transmission source and destination through only at

14　　least one wavelength switch and an optical wavelength

15　　path which connects the packet transfer apparatuses

16　　through a frame transfer apparatus in accordance with an

17　　optical wavelength path connection request received from

18　　the transmission source user terminal through the packet

19　　transfer apparatus, and comprises:

20　　　　　　　a forwarding processing unit which manages

21　　correspondence between a destination upper layer packet

22　　address and a destination lower layer frame address and

23　　executes mutual conversion of a destination address of a

24　　received packet between an upper layer and a lower layer

25　　on the basis of an address management table in which

26　　correspondence between an upper layer packet address of

27　　a user terminal which is stored in the packet transfer

28　　apparatus and a lower layer frame address corresponding

29　　to the optical wavelength path is registered in

30　　accordance with setting of the optical wavelength path

31　　from the admission control server;

32　　　　　　　a packet processing unit which encapsulates

33　　the upper layer packet received from the user terminal

34　　in the lower layer frame and decapsulates the lower

35 layer frame received from the optical wavelength path to

36 the upper layer packet; and

37   a transmission frame processing unit which

38 transfers the packet encapsulated by said packet

39 processing unit to the optical wavelength path

40 corresponding to the destination lower layer frame

41 address obtained by said forwarding processing unit and

42 transfers the packet decapsulated by said packet

43 processing unit to the user terminal of the destination

44 upper layer packet address obtained by said forwarding

45 processing unit.

            17. A packet transfer apparatus according to

2   claim 16, characterized in that

3   said forwarding processing unit uses, as the

4   address management table, an address management table in

5   which correspondence between the upper layer packet

6   address of a destination user terminal and the lower

7   layer frame address corresponding to the optical

8   wavelength path is registered in accordance with setting

9   of the optical wavelength path from the admission

10 control server, and

11   said transmission frame processing unit

12 transfers the lower layer frame obtained by

13 encapsulating the upper layer packet from the user

14 terminal side to the optical wavelength path of the

15 destination lower layer frame address obtained from the

16 address management table in correspondence with the

17 destination upper layer packet address.

18. A packet transfer apparatus according to

2 claim 16, characterized in that

3 said forwarding processing unit uses, as the

4 address management table, an address management table in

5 which correspondence between the upper layer packet

6 addresses of transmission source and destination user

7 terminals and the lower layer frame address

8 corresponding to the optical wavelength path is

9 registered in accordance with setting of the optical

10 wavelength path from the admission control server, and

11 said transmission frame processing unit

12 transfers the lower layer frame obtained by

13 encapsulating the upper layer packet from the user

14 terminal side to the optical wavelength path of the

15 destination lower layer frame address obtained from the

16 address management table in correspondence with the

17 transmission source and destination upper layer packet

18 addresses.

19. An admission control server characterized

2 in that said admission control server is used in a

3 packet communication network formed from a network

4 logically built on a photonic network including a

5 transmission link having an optical wavelength path

6 multiplex transmission function and a wavelength switch

7 having an optical wavelength path switching function,

8 the packet communication network comprising a packet

9   transfer apparatus which stores a plurality of user

10 terminals, is connected to an optical wavelength path of

11 the photonic network, and executes mutual conversion and

12 transfer of an upper layer packet on a side of a user

13 terminal corresponding to an upper layer packet address

14 and a lower layer frame on a side of an optical

15 wavelength path corresponding to a lower layer frame

16 address on the basis of an address management table

17 which manages correspondence between the upper layer

18 packet address and the destination lower layer frame

19 address, and comprises:

20   a route setting function unit which sets, of

21 optical wavelength paths of the photonic network, an

22 optical wavelength path formed from a cut-through

23 optical wavelength path which has a guaranteed band and

24 directly connects packet transfer apparatuses of

25 transmission source and destination in accordance with

26 an optical wavelength path connection request received

27 from the transmission source user terminal through the

28 packet transfer apparatus; and

29   an external device management function unit

30 which registers correspondence between the upper layer

31 packet address of the user terminal and the lower layer

32 frame address corresponding to the optical wavelength

33 path in the address management tables of the packet

34 transfer apparatuses of the transmission source and

35 destination in setting the optical wavelength path.

20. An admission control server according to
2 claim 19, characterized in that in setting the optical
3 wavelength path, said route setting function unit sets
4 the optical wavelength path formed from the cut-through
5 optical wavelength path between the packet transfer
6 apparatuses of the transmission source and destination
7 when a band guarantee request is present and sets an
8 optical wavelength path which connects the packet
9 transfer apparatuses of the transmission source and
10 destination through a frame transfer apparatus to
11 transfer the lower layer frame through the photonic
12 network when no band guarantee request is present.

21. An admission control server according to
2 claim 19, characterized by further comprising an optical
3 wavelength path setting determination function unit
4 which confirms presence/absence of the band guarantee
5 request by referring to contract user information of a
6 band guarantee service, which is registered in
7 correspondence with each user terminal in advance, on
8 the basis of the transmission source upper layer packet
9 address of the transmission source user terminal
10 contained in the optical wavelength path connection
11 request.

22. An admission control server according to
2 claim 19, characterized by further comprising a
3 destination packet transfer apparatus specifying table
4 which guides, from the destination upper layer packet

5 address, a destination lower layer frame address prefix

6 representing the destination packet transfer apparatus

7 which stores a user terminal having the address,

8   wherein said route setting function unit

9 specifies the transmission source packet transfer

10 apparatus on the basis of the transmission source lower

11 layer frame address prefix contained in the optical

12 wavelength path connection request, specifies the

13 destination packet transfer apparatus on the basis of

14 the destination upper layer packet address contained in

15 the optical wavelength path connection request by

16 looking up said destination packet transfer apparatus

17 specifying table, and sets the cut-through optical

18 wavelength path between the transmission source packet

19 transfer apparatus and the destination packet transfer

20 apparatus by controlling the transmission source packet

21 transfer apparatus, the destination packet transfer

22 apparatus, and the wavelength switch of the photonic

23 network.

   23. An admission control server according to

2 claim 19, characterized in that in setting the optical

3 wavelength path, by transmitting a table control packet

4 to the packet transfer apparatus, said external device

5 management function unit adds, to the address management

6 table of the packet transfer apparatus, a destination

7 lower layer frame address which corresponds to the

8 destination upper layer packet address and contains a

9   lower layer frame address prefix representing the

10   destination packet transfer apparatus and an identifier

11   representing an optical wavelength path to be used.

24. An admission control server according to

2   claim 19, characterized in that in setting the optical

3   wavelength path, said external device management

4   function unit adds, to the address management table of

5   the packet transfer apparatus, a destination lower layer

6   frame address which corresponds to the transmission

7   source and destination upper layer packet addresses and

8   contains a lower layer frame address prefix representing

9   the destination packet transfer apparatus and an

10   identifier representing an optical wavelength path to be

11   used by transmitting a table control packet to the

12   packet transfer apparatus.

25. An optical wavelength path setting method

2   characterized by comprising:

3   the step of causing a plurality of packet

4   transfer apparatuses each of which stores a plurality of

5   user terminals and is connected to an optical wavelength

6   path of a photonic network including a transmission link

7   having an optical wavelength path multiplex transmission

8   function and a wavelength switch having an optical

9   wavelength path switching function to encapsulate, in a

10   lower layer frame, an upper layer packet received from

11   one of a user network which stores a transmission source

12   user terminal and an external network which stores the

13 transmission source user terminal and transfer the lower

14 layer frame, in transmitting the lower layer frame to

15 the external network, transfer the lower layer frame

16 after decapsulating the lower layer frame to the upper

17 layer packet, and execute mutual conversion and transfer

18 of an upper layer packet on a side of a user terminal

19 corresponding to an upper layer packet address and a

20 lower layer frame on a side of an optical wavelength

21 path corresponding to a lower layer frame address on the

22 basis of an address management table which manages

23 correspondence between the upper layer packet address

24 and the destination lower layer frame address;

25   the step of causing a frame transfer apparatus

26 which is connected to the optical wavelength path of the

27 photonic network to receive the lower layer frame from

28 the transmission source packet transfer apparatus and

29 transfer the lower layer frame to a packet transfer

30 apparatus corresponding to the upper layer packet

31 address of the upper layer packet in the lower layer

32 frame;

33   the step of causing an admission control

34 server which is connected to the wavelength switch, the

35 packet transfer apparatus, and the frame transfer

36 apparatus to set, of optical wavelength paths of the

37 photonic network, an optical wavelength path to connect

38 packet transfer apparatuses of transmission source and

39 destination in accordance with an optical wavelength

40   path connection request received from the transmission

41   source user terminal through the packet transfer

42   apparatus; and

43   the route setting function step of, in setting

44   the optical wavelength path, causing the admission

45   control server to register correspondence between the

46   upper layer packet address of the user terminal and the

47   lower layer frame address corresponding to the optical

48   wavelength path in the address management tables of the

49   packet transfer apparatuses of the transmission source

50   and destination, set, between the packet transfer

51   apparatuses of the transmission source and destination,

52   an optical wavelength path formed from a cut-through

53   optical wavelength path which has a guaranteed band and

54   passes through only at least one wavelength switch when

55   a band guarantee request is present, and set an optical

56   wavelength path which connects the packet transfer

57   apparatuses of the transmission source and destination

58   through the frame transfer apparatus when no band

59   guarantee request is present.

        26.   A program which causes a computer of a

2   packet transfer apparatus provided in a packet

3   communication network formed from a network logically

4   built on a photonic network including a transmission

5   link having an optical wavelength path multiplex

6   transmission function and a wavelength switch having an

7   optical wavelength path switching function, the packet

8   communication network comprising an admission control

9   server which sets, of optical wavelength paths of the

10   photonic network, one of an optical wavelength path

11   formed from a cut-through optical wavelength path which

12   has a guaranteed band and connects packet transfer

13   apparatuses of transmission source and destination

14   through only at least one wavelength switch and an

15   optical wavelength path which connects the packet

16   transfer apparatuses through a frame transfer apparatus

17   in accordance with an optical wavelength path connection

18   request received from the transmission source user

19   terminal through the packet transfer apparatus, to

20   execute:

21   the forwarding processing step of managing

22   correspondence between a destination upper layer packet

23   address and a destination lower layer frame address and

24   executing mutual conversion of a destination address of

25   a received packet between an upper layer and a lower

26   layer on the basis of an address management table in

27   which correspondence between an upper layer packet

28   address of a user terminal which is stored in the packet

29   transfer apparatus and a lower layer frame address

30   corresponding to the optical wavelength path is

31   registered in accordance with setting of the optical

32   wavelength path from the admission control server;

33   the packet processing step of encapsulating

34   the upper layer packet received from the user terminal

35   in the lower layer frame and decapsulating the lower

36   layer frame received from the optical wavelength path to

37   the upper layer packet; and

38   the transmission frame processing step of

39   transferring the packet encapsulated in the packet

40   processing step to the optical wavelength path

41   corresponding to the destination lower layer frame

42   address obtained in the forwarding processing step and

43   transferring the packet decapsulated in the packet

44   processing step to the user terminal of the destination

45   upper layer packet address obtained in the forwarding

46   processing step.

      27.   A program which causes a computer of an

 2   admission control server provided in a packet

 3   communication network formed from a network logically

 4   built on a photonic network including a transmission

 5   link having an optical wavelength path multiplex

 6   transmission function and a wavelength switch having an

 7   optical wavelength path switching function, the packet

 8   communication network comprising a packet transfer

 9   apparatus which stores a plurality of user terminals, is

10   connected to an optical wavelength path of the photonic

11   network, and executes mutual conversion and transfer of

12   an upper layer packet on a side of a user terminal

13   corresponding to an upper layer packet address and a

14   lower layer frame on a side of an optical wavelength

15   path corresponding to a lower layer frame address on the

16 basis of an address management table which manages

17 correspondence between the upper layer packet address

18 and the destination lower layer frame address, to

19 execute:

20   the route setting function step of setting, of

21 optical wavelength paths of the photonic network, an

22 optical wavelength path formed from a cut-through

23 optical wavelength path which has a guaranteed band and

24 directly connects packet transfer apparatuses of

25 transmission source and destination in accordance with

26 an optical wavelength path connection request received

27 from the transmission source user terminal through the

28 packet transfer apparatus; and

29   the external device management function step

30 of registering correspondence between the upper layer

31 packet address of the user terminal and the lower layer

32 frame address corresponding to the optical wavelength

33 path in the address management tables of the packet

34 transfer apparatuses of the transmission source and

35 destination in setting the optical wavelength path.

        28. A recording medium which records a

2 program to cause a computer of a packet transfer

3 apparatus provided in a packet communication network

4 formed from a network logically built on a photonic

5 network including a transmission link having an optical

6 wavelength path multiplex transmission function and a

7 wavelength switch having an optical wavelength path

8   switching function, the packet communication network

9   comprising an admission control server which sets, of

10   optical wavelength paths of the photonic network, one of

11   an optical wavelength path formed from a cut-through

12   optical wavelength path which has a guaranteed band and

13   connects packet transfer apparatuses of transmission

14   source and destination through only at least one

15   wavelength switch and an optical wavelength path which

16   connects the packet transfer apparatuses through a frame

17   transfer apparatus in accordance with an optical

18   wavelength path connection request received from the

19   transmission source user terminal through the packet

20   transfer apparatus, to execute:

21   the forwarding processing step of managing

22   correspondence between a destination upper layer packet

23   address and a destination lower layer frame address and

24   executing mutual conversion of a destination address of

25   a received packet between an upper layer and a lower

26   layer on the basis of an address management table in

27   which correspondence between an upper layer packet

28   address of a user terminal which is stored in the packet

29   transfer apparatus and a lower layer frame address

30   corresponding to the optical wavelength path is

31   registered in accordance with setting of the optical

32   wavelength path from the admission control server;

33   the packet processing step of encapsulating

34   the upper layer packet received from the user terminal

35 in the lower layer frame and decapsulating the lower

36 layer frame received from the optical wavelength path to

37 the upper layer packet; and

38   the transmission frame processing step of

39 transferring the packet encapsulated in the packet

40 processing step to the optical wavelength path

41 corresponding to the destination lower layer frame

42 address obtained in the forwarding processing step and

43 transferring the packet decapsulated in the packet

44 processing step to the user terminal of· the destination

45 upper layer packet address obtained in the forwarding

46 processing step.

        29.   A recording medium which stores a program

2   to cause a computer of an admission control server

3   provided in a packet communication network formed from a

4   network logically built on a photonic network including

5   a transmission link having an optical wavelength path

6   multiplex transmission function and a wavelength switch

7   having an optical wavelength path switching function,

8   the packet communication network comprising a packet

9   transfer apparatus which stores a plurality of user

10 terminals, is connected to an optical wavelength path of

11 the photonic network, and executes mutual conversion and

12 transfer of an upper layer packet on a side of a user

13 terminal corresponding to an upper layer packet address

14 and a lower layer frame on a side of an optical

15 wavelength path corresponding to a lower layer frame

16 address on the basis of an address management table

17 which manages correspondence between the upper layer

18 packet address and the destination lower layer frame

19 address, to execute:

20   the route setting function step of setting, of

21 optical wavelength paths of the photonic network, an

22 optical wavelength path formed from a cut-through

23 optical wavelength path which has a guaranteed band and

24 directly connects packet transfer apparatuses of

25 transmission source and destination in accordance with

26 an optical wavelength path connection request received

27 from the transmission source user terminal through the

28 packet transfer apparatus; and

29   the external device management function step

30 of registering correspondence between the upper layer

31 packet address of the user terminal and the lower layer

32 frame address corresponding to the optical wavelength

33 path in the address management tables of the packet

34 transfer apparatuses of the transmission source and

35 destination in setting the optical wavelength path.